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Radioactive News

For Radioactive Material Licensees in North Dakota

North Dakota Department of Health

Rule Revision 2005

The Radiation Control Program is once again revising the North Dakota Radiological Health Rules. As an Agreement State, North Dakota is granted the authority to regulate the use of certain radioactive materials within its boundaries and must maintain compatibility with the U.S. Nuclear Regulatory Commission (NRC).

Planned changes to the current version of the North Dakota Radiological Health Rules include:

1. Adjustments to bring the amount of financial assurance required for certain licensees more in line with today's decommissioning costs.
2. Modifications for compatibility with International Atomic Energy Agency (IAEA) regulations governing the packaging and transportation of radioactive materials.
3. Security requirements specifying that two independent physical controls be used by portable nuclear gauge users to minimize opportunities for unauthorized access, removal or theft.
4. Updated requirements for the recognition of medical specialty boards whose certifications may be used by individuals to demonstrate adequacy of their training and experience; and an extension of the expiration date of previous training and experience requirements.

(Continued on page 2)

In This Issue

National Source Tracking System

On July 20, 2005, the NRC announced that it is considering new regulations to implement a national tracking system for certain radioactive materials used for academic, medical and industrial purposes.

The NRC is working closely with other federal agencies and states to develop the National Source Tracking System (NSTS). The radioactive materials that will be tracked in the system include, but are not limited to, sources of Cobalt-60, Strontium-90, Cesium-137, Iridium-192 and Americium-241 containing a quantity of these radioactive materials equal to or greater than the Category 2 levels listed in a new Appendix F to 10 CFR Part 20.

The proposed amendment to NRC regulations would require licensees to report information on the manufacture, transfer, receipt or disposal of these sources of interest to an automated NSTS.

Each licensee would also have to provide its initial inventory of nationally tracked sources to the NSTS and annually verify and reconcile information in the system with actual inventory. In addition, the rule change would require manufacturers to assign a unique serial number to each nationally tracked source.

Once fully operational in December 2006, the NSTS would help NRC, and Agreement States like North Dakota, conduct inspections and investigations, communicate nationally tracked source information to other government agencies and verify legitimate ownership and use of these radioactive sources.

To obtain additional information on this proposed rulemaking or to provide comments, contact Merri Horn, Division of Industrial and Medical Nuclear Safety, 301.415.8126; e-mail: mlh1@nrc.gov.

SAY WHAT?

There is no likelihood man can ever tap the power of the atom. – Robert Millikan, who won the Nobel Prize in Physics in 1923.

'tever

(Continued from "Rule Revision" page 1)

5. Considerations during or after subsurface tracer studies when radioactive material is reversed from the well or the well screens-out during formation fracturing operations.
6. Changes related to machine generated radiation and x-ray operator continuing education training requirements.
7. An adjustment of fees charged to licensees and registrants to maintain a 70 percent to 75 percent budget recovery as requested by the legislature.
8. Minor corrections and clarifications throughout the regulations.

Public comment periods and public hearings will be conducted. The final draft of this revised version of North Dakota Administrative Code Article 33-10, "Radiological Health Regulations," will be sent to the State Health Council this Fall. The effective date of the amended rule is anticipated to be Sept. 1, 2006.

If you have any questions about the radiological health rules, or to request copies, please contact the Radiation Control Program at 701.328.5188 or send an email message to Ken Wangler at kwangler@state.nd.us.

NOTICE:

The entire physical universe, including this newsletter, may one day collapse back into an infinitely small space. Should another universe subsequently emerge, the existence of this newsletter in the new universe cannot be guaranteed.

Nuclear Medicine May Trigger Security Alarms

The recent deployment of radiation detectors to police officers, airport security personnel and border patrol officers across the country has led to some patients being isolated and investigated by emergency responders following administration of therapeutic and even diagnostic radiopharmaceutical doses.

According to Lionel Zuckier, M.D., a professor of radiology at the New Jersey's University of Medicine, patients can trigger radiation detectors for up to three months after undergoing certain nuclear medicine procedures.

For example, the NRC has alerted medical licensees to an event where an outpatient who had undergone a nuclear medicine procedure ignored written safety instructions not to travel for two days. The patient boarded a bus traveling from New York to Atlantic City. The bus was subsequently pulled over when an alarm sounded in a tunnel. While there was no danger to those on the bus, the incident did cause unnecessary concern for travelers and law enforcement officials.

As indicated by Dr. Zuckier's study, trace quantities of medical radionuclides remaining in the body can set off radiation detectors for variable periods of time:

- PET scan — Less than one day
- Bone and thyroid scan — Three days
- Cardiac thallium exams — Up to 30 days
- Iodine or Bexxar therapy — Up to 95 days *(Bexxar therapy involves an antibody conjugated to radio-labeled iodine.)*

(Continued on page 4)

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Don't Let this Happen to You

Noncompliance with established regulations discovered during inspections performed by regulatory agencies often result in citations, violations and even civil penalties. It is hoped that by reviewing the following violations and penalties, extra care will be taken in maintaining your radiation safety program while performing licensed activities. A few examples of recent violations and associated penalties assessed by the U.S. Nuclear Regulatory Commission (NRC) appear below:

- A notice of violation and civil penalty in the amount of $44,400 was issued for a number of willful violations related to an event involving personnel entering an irradiator room when the radioactive source was stuck in an unshielded position. NRC assessed a penalty of $28,800 for three occurrences of failure to adhere to emergency procedures and $9,600 for failure to perform an adequate survey. In addition, a willful violation for failure to provide individual radiation monitoring devices to workers added another $6,000 to the penalty amount.
- An order imposing civil penalty in the amount of $9,600 was issued to a portable gauge company for discrimination against an employee for reporting safety concerns to the NRC. The employee's concerns had resulted in an earlier notice of violation for the company.
- A notice of violation was issued to an individual for deliberate activities while employed at a licensed medical facility. As a nuclear medicine technologist, the individual knowingly used licensed radioactive material without the knowledge and approval of a physician-authorized user as required by the license. A civil penalty has not yet been levied in this instance.
- An order revoking license was issued to a radiography company based on the licensee's deliberate acts and omissions involving radiography activities and the NRC's lack of reasonable assurance that the public health and safety would be adequately protected by continuing radiographic activities under the license.
- A notice of violation was issued to a university for failure to control and maintain constant surveillance of licensed material in three laboratories that were in unrestricted areas and where the radioactive material was not in a secure storage location. A civil penalty has not yet been levied in this instance.
- A notice of violation was issued to a medical facility for 12 violations indicating a lack of appropriate oversight and control of the brachytherapy program, including a programmatic weakness in the implementation of written directives. The licensee's poor management oversight of the brachytherapy radiation safety program resulted in missed opportunities to identify precursors associated with five medical events and failure to promptly identify and report those medical events to the NRC. The case is still pending.

Additional examples of the NRC's significant enforcement actions can be reviewed in the NMSS Licensee Newsletter, which is available at www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0117/.

Blast from the Past

January 19, 1961 – Near Monticello, Utah

A B-52 bomber carrying one or more nuclear weapons exploded in midair about 10 miles north of Monticello, Utah. The bomber was bound for Bismarck, N.D. on a routine training mission. Near Monticello the aircraft began climbing and soon experienced a violent bump followed by a descending right roll, then nose-down flight, and finally a violent spin. At 7,000 feet, the bomber broke into several pieces that landed in a swatch two miles wide by 11½ miles long. Observers on the ground said the plane's left-wing engine caught fire, after which there was a midair explosion. Status or recovery of the nuclear weapons was not mentioned in the unclassified accident report. *(Source: Center for Defense Information; but this accident has not been acknowledged or verified by official government sources.)*

Please note that nuclear weapons are designed with great care to explode only when deliberately armed and fired.

(Continued from "Nuclear Medicine" page 2)

Dr. Zuckier supports recommendations made by the Society of Nuclear Medicine (SNM) and the NRC that radiologists and hospitals provide official documentation to the more than 18 million patients who undergo nuclear medicine and therapeutic procedures each year.

SNM says radiologists can help patients and security personnel by providing patients with a letter or note card that contains the following information:

- Patient name
- Hospital or clinic information
- Type and date of nuclear medicine procedure
- Radionuclide used
- Half-life of the medical isotope(s)
- Administered activity
- 24-hour contact information

The letter or card needs to provide specific details about who should be contacted, if necessary, for verification. Outside of normal working hours, the contact person should have access to an appropriate source of information such as a hospital or radiology information system, so that patient information can be independently confirmed.

While this is an extremely important matter, Dr. Zuckier says his study should not alarm the public nor should patients avoid needed procedures for fear of triggering radiation alarms. The amount of radiation a patient receives from a typical nuclear medicine procedure is minimal, but he says under the current climate of security consciousness, patients should at least be provided with a note from their doctors.

Did You Know?

That antiparticles can be created from energy (remember: $E=mc^2$)? According to NASA, 42 milligrams of antiprotons possess the energy equivalent of the fuel in the space shuttle's large external tank.

However, if the European Laboratory for Particle Physics (CERN) ran their "Antiproton Decelerator" 24/7 for a year, it would only generate 10 picograms of antiprotons (where 1 picogram = 1×10^{-9} milligram).

DOT Training Notes

If you transport or ship radioactive material, hazmat training is critical to your business. According to the U.S. Department of Transportation (DOT):

> *More than one-third of the enforcement actions pertaining to violations of the hazmat transportation regulations (49 CFR) involve the failure of hazmat employers to provide training or maintain test records. In most cases, violations are attributed to failure to provide function specific training.*

Each hazmat employer must train and test, certify, and retain records of current training for each hazmat employee involved in receipt, preparation for shipment or actual transportation of radioactive material.

Hazmat employee instruction must include general awareness/familiarization, function-specific, safety and security training.

Recurrent training is required every three years under DOT rules. However, if radioactive material is shipped by air (e.g., Fed Ex), retraining is required every two years under International Air Transport Association (IATA) regulations.

If you have any questions about hazmat training, please contact the Radiation Control Program at 701.328.5188 or send an email message to Jim Killingbeck at jkilling@state.nd.us.

Staffing Change

Justin Griffin, a Radiation Control Program team member since Nov. 1997, recently accepted an employment opportunity with Los Alamos National Laboratory (LANL) in New Mexico.

His new position will be as a technical staff member of the Advanced Nuclear Technology Group in LANL's Nuclear Nonproliferation Division.

Initially, he will work with LANL's Off-Site Source Recovery Project (OSRP), which addresses homeland security by providing a means to aggressively remove radioactive materials from the environment which could pose a terrorist threat if improperly acquired.

We are excited about his new career opportunity despite the fact that it will be difficult having him and his wife leave North Dakota.

Justin stated that he will miss working with all North Dakota licensees and wishes everyone well. To contact Justin, send email messages to justgriff@yahoo.com.